

and the "Argille scagliose," by Theodor Fuchs.—On the flora of the countries round the Mediterranean and their dependence from the soils, by the same.—On the fossil flora of Parschlug, in Styria, by Dr. C. von Ettingshausen.—On the development of the embryo of *Asplenium shepherdii*, Spr., by F. Vouk.—On the internal cells in the antheridium cell of the pollen grain of certain coniferæ, by A. Tomaschek.—On the origin of aptychus-limestone, by Th. Fuchs.—On the light line in the prism cells of seed scales, by Dr. R. Junowics.—On the encircled specks in the wood of trees, by Dr. J. Kreuz.—On the firmness and elasticity of vegetable tissues and organs, by Th. Weinzierl.—On the resinous ducts of certain coniferæ, by Dr. Kreuz.—On the development of the pollen of *Colchicum autumnale*, L., by A. Tomaschek.—On some accessory appendages to the skull of Leporidae, by Dr. A. von Mojsisovics.—On cork and cork tissues, by Dr. F. von Höhnelt.—Histo-chemical researches on xylophiline and coniferine, by the same.—On the phanerogamic flora of the Sandwich Islands, by Dr. H. W. Reichardt.—On the protoplasm of the pea, by Dr. Ed. Tangl.—On the undulating nutation of the internodes of the stems of plants, by J. Wiesner.—On the behaviour of Phloroglucine and of some similar substances towards the woody cell membrane, by the same.—On the degeneration in the leaf-shoots of some Amygdaleæ, caused by species of *Exoascus*, by E. Rathay.—Researches on Tunicata, by C. Heller.—On some new genera and species of Neuroptera, by Dr. F. Brauer.—On the originals to Ign. von Born's Testaceis Musei Casarei Vindobonensis, found in the Imperial Zoological Museum, by the same.—On the embryology of ferns, by H. Leitgeb.—Geological researches in the western part of the Balkan and the surrounding districts, by Franz Toula.—On some peculiar apertures in the corolla leaves of *Franseria macrantha*, Pohl, by M. Waldner.—On the basaltic lava of the Eifel Mountains, by E. Hussak.—On the origin of holes and indentures in the leaf of *Philodendron pertusum*, Schott, by F. Schwarz.—Ichthyological researches, by Dr. F. Steindachner.—On the subterranean water-courses and basins, as well as on the clearness and transparency of certain lakes, and on the formation of lakes generally, by Dr. A. Boué.

Sitzungsberichte der physikalisch-medizinischen Societät zu Erlangen (part 10, November, 1877—August, 1878) contain the following more interesting papers:—On the fertilisation and division of the ovum of *toxopneustes*, by Dr. E. Selenka.—On the history of development of Jacobson's organ, by Dr. R. Fleischer.—On the theory of absorption and fluorescence, by E. Lommel.—On the physiological action of nitro-benzole and of aniline, by W. Filehne.—On the so-called soor-fungus and its identity with *Mycoderma vini*, by M. Reess.—On the changeability of the angles of crystals, by Dr. Fr. Pfaff.—On the theory of normal and abnormal dispersion, by E. Lommel.—Various mathematical papers, by M. Noether and Prof. E. Lüroth.—On the modification of sound phenomena in the human body, by F. Penzoldt.—On the theory of double refraction, by E. Lommel.—On the equations of the seventh degree, by F. Klein.—On some experiments made with *drosera*, by Drs. C. Kellerman and E. von Ramner.—On chelidonic and malic acids, by Dr. O. Liezenmayer.—Thermophysiological investigations, by J. Rosenthal.—On the derivatives of cymol and of toluylic acid, by E. von Gerichten.—On the sexual organs of dibranchiate cephalopoda, by Dr. J. Brock.—On two new fluorescent substances, by E. Lommel.—On the influence of the changes in temperature and pressure upon the double refraction of light, by Dr. E. Pfaff.

Jahrbuch der k.k. geologischen Reichsanstalt (vol. xxviii. part 4, October—December, 1878) contains several highly interesting treatises, viz.:—On Alpine phosphates, by J. Gamper.—On the production of common salt from the Russian steppe lakes, by Dr. C. O. Cech.—Observations on the Jurassic formation in the Carpathian cliffs, by Victor Uhlig.—On the artesian well in the Stadtwäldchen near Budapest, by Wilhelm Zsigmondy.—On Emanuel Kaiser's views on the hercynian fauna, and the limit between the Silurian and Devonian formations, by Dr. E. Tietze.

Reale Istituto Lombardo di Scienze e Lettere. Rendiconti. Vol. xii. fasc. iii. We note the following papers in this number:—New phenomena observed in treatment of wine and must, with lime (continued), by Prof. Pollacci.—New physio-pathological researches on pulmonary phthisis (continued), by Prof. Giovanni.—Project of an electrical indicator of the level of water in a flood, by Prof. Ferrini.—Amplitude of oscillations of the declination-needle during 1877 and 1878, at the observatory of

Brera, in Milan, communicated by S. Schiaparelli.—Determination of the difference of longitude between Milan Observatory and those of Padua, Monaco, and Vienna, by Prof. Celoria.

Fasc. iv.—First lines of introduction to the study of Italian bacteria (continued), by S. Trevisan.—Composition of butters in Lombardy, and analysis of butter in general, by Dr. Menozzi.—New researches on the rot of vines, by Prof. Garovaglio.—Researches on polar systems, by Prof. Jung.—On provision against trichina, by Prof. Bizzozero.

Fasc. v.—A new process of microscopic art, by Prof. Golgi.—Fruitful copulation of a dog with a cat, by Prof. Lemoigne.—On the intestinal anguillula, by Prof. Cantoni.

Atti della R. Accademia dei Lincei, February, 1879.—Necrological memoir of Gastaldi, by S. Sella.—On the expression of one of the limits in the correction of the elliptical co-ordinates in the theory of planetary perturbations, by S. De Gasparis.—On the composition of rocks of the mines of Montecortini, by S. Cossa.

Rivista Scientifico-Industriale, Nos. 4 and 5, 1879.—We note in these numbers a memoir by Prof. Perotti, on governing combination of the elements of gaseous mixtures.

No. 6.—On a baricentric property of the triangle, by Prof. E. Cavalli.—On a new experiment on electrolysis with weak electromotors, by Prof. A. Bartoli.—On the telephone and microphone as musical instruments, by G. Mocenigo.—Description of some new plants recently introduced into horticulture, by E. O. Fenzi. There plants are *Gentiana algida*, *Primula capitata*, and *P. stuartii*, *Nicotiana acutifolia* and *N. suaveolens*, *Eremurus robustus*.—On two new species of Myriapoda, *Polydesmus siculus* and *Atractosoma nigrum*, by Prof. F. Fanzago.—On a new reagent for cobalt, by Mr. Tattersall.—On poisonous colours, by the editor.

Archives des Sciences physiques et naturelles, March.—From this part we notice the following papers of interest:—On the influence of coloured light upon the development and growth of animals, by Emile Yung.—On the effects of induction coils upon the nervous system, by M. Schiff.—On an acceleration of the process of tanning by means of phosphoric acid, by E. Ador.—On methyl-aniline and toluidine and the colouring-matters derived from these compounds, by MM. Reverdin, Monnet, and Nöbling.—On alizarine blue, by M. Graebe.—The other papers contained in the part have been noticed by us elsewhere.

SOCIETIES AND ACADEMIES

LONDON

Mathematical Society, April 10.—C. W. Merrifield, F.R.S., president, in the chair.—Mr. Donald McAlister was elected a Member, and Messrs. A. J. C. Allen and E. Anthony were proposed for election.—The following communications were made:—Notes on quantics of alternate numbers, used as a means for determining the invariants and covariants of quantics in general, by the late Prof. Clifford, F.R.S. (communicated by Dr. Spottiswoode, F.R.S.).—Note on geometrical maxima and minima, Mr. J. Hammond.—On a class of fractions, Mr. R. Tucker.

Linnean Society, April 3.—William Carruthers, F.R.S., vice-president, in the chair.—Mr. W. T. Threlton Dyer exhibited the inflorescence of *Gynerium saccharoides*, grown at Kew, but which had died during the winter severe weather. Excepting through Mr. Spruce's researches on the Amazons, little is known respecting this handsome plant, which differs from the Pampas grass in habit, and is tropical like maize, &c.—Dr. H. Trimen, in dealing with the subject of the myrrhs of commerce and pharmacy, showed the unique *Balsamodendron myrrha*, Nees. It was gathered by Hildebrandt in Somali Land, 1873, and possesses but few leaves and a single fruit; the traveller, however, saw the myrrh exuding from the tree itself. The original type specimens of *B. myrrha*, collected by Prof. Ehrenberg in Arabia, were also exhibited, and according to Dr. Trimen, Hildebrandt's late statement of their identity with the foregoing seems well founded. Ehrenberg's other myrrh plant, the *B. Ehrenbergianum*, Berg., with his notes attached, and the *B. Playfairii*, Hook. fil., from Somali Land, with its gum called "Hotai," and other examples of varieties of myrrh and bdellium were placed before the Society and commented on by Dr. Trimen. He specially adverted to the liberality of the authorities

of the Royal Berlin Herbarium and of the Hanbury Collection for being enabled to study the rare valuable specimens laid before the Fellows of the Linnean Society.—The account of a remarkable peat flood in the Falkland Islands, by Mr. Arthur Bailey, was communicated by Mr. W. T. Thiselton Dyer. About midnight, November 29, 1878, it was discovered that a black moving mass of peat, several feet high, was making its way towards the settlement at the rate of between four and five miles an hour. The next morning (30th) it was found that the town of Stanley was cut in two, intercourse between its east and west ends alone being possible by boats. Fortunately no lives were lost, and by the energy and activity of the inhabitants in the formation of a trench, much injury and destruction were considerably arrested.—The Secretary read in abstract some notes on *Moquilea*, with a description of a new species by Mr. John Miers. The author specially compares and marks the differences between the genera *Moquilea* and *Licania*, they having often been confounded, and he afterwards points out the distinctive characters constituting his new species, *Moquilea organensis*.

Chemical Society, April 3.—Mr. Warren De La Rue, president, in the chair.—The following papers were read:—On terpin and terpinol, by Dr. Tilden. The author has continued his previous researches, and has succeeded in obtaining crystals of terpin hydrate from essence of lemon; the author considers terpinol to have the constitution of an alcohol. Oil of lemon cajeputol, oil of coriander, and citronella contain bodies closely resembling terpinol.—On a gold nugget from South America, by Mr. G. Attwood. These nuggets are found in alluvial soil in Venezuela. Numerous gold-bearing quartz-veins are found in the neighbouring hills. About one-half of the nuggets are covered with a dark brown substance resembling a silicate of iron. When this is dissolved much finely divided gold separates, and the nugget is partly covered with dull fine gold. The gold obtained from the quartz is less pure than that of the nuggets. The author concludes that gold nuggets gradually increase in size owing to the accumulation of fresh particles of finely-precipitated gold.—On lead tetrachloride, by Mr. W. W. Fisher. The author has not isolated this compound, but has obtained it in solution by dissolving lead dioxide in hydrochloric acid; the yellow solution thus formed precipitates brown hydrated peroxide of lead when treated with solutions of alkalis, &c. The author also suggests the use of chlorine or bromine in the presence of sodium acetate as a means of quantitatively determining lead by precipitation as a peroxide.—On the transformation of aurin into trimethyl pararosanilin, by Messrs. Dale and Schorlemmer. This is effected by the action of an aqueous solution of methylamine at 125° on aurin.—On the solution of aluminium hydrate by ammonia and a physical isomeride of alumina, by C. F. Cross. By boiling the ammoniacal solution of alumina hydrate a precipitate is obtained, which on drying and ignition furnishes alumina which is extremely hygroscopic, absorbing 35 per cent. of water.—Researches on dyeing, Part ii. Note on the emission of colouring matter, by Dr. Mills and Mr. Campbell. The experiments were made with silk and a dilute solution of Nicholson's blue. The authors affirm that a real and uniform dyeing effect can always be obtained with silk and Nicholson's blue, the heat and souring used by dyers being inadvisable. The authors recommend the addition of common salt to the vat.

Geological Society, March 26.—Henry Clifton Sorby, F.R.S., president, in the chair.—William Adamson Barron, Gregory Dent, Julian John Levenson, and Rear-Admiral Francisco Sangro Tremlett, R.N., were elected Fellows of the Society.—The following communications were read:—Results of a systematic survey (in 1878) of the directions and limits of dispersion, mode of occurrence, and relation to drift-deposits of the erratic blocks or boulders of the west of England and east of Wales, including a revision of many years' previous observations, by D. Mackintosh, F.G.S. The author's researches lead him to the following conclusions:—Boulders from the North-Criffl range and Lake-district can be traced from the Solway Firth to near Bromsgrove (about 200 miles), and over an area in greatest breadth (from near Macclesfield to Beaumaris) of 90 miles, those from Criffl being particularly abundant near Wolverhampton. Boulders from the Arenig occupy a triangular area, limited by a line drawn northward from Chirk to the Dee estuary, and to the south-east of that town are found as far as Birmingham and Bromsgrove. The dispersion of the more distant Criffl boulders would require submergences of from 400 to 1,400 feet; of the Lake-district a little deeper; while the distant dispersion of the Arenig boulders took place at sub-

mergences between 800 and 2,000 feet. The author describes several of the more local drifts, and correlates the lower boulder-clay of the north-west with the chalky boulder-clay of the east of England. He considers floating ice, not land ice, to have been the agent of dispersion.—On the glaciation of the Shetland Isles, by B. N. Peach, F.G.S., and John Horne, F.G.S. After an account of previous opinion on the subject, the authors proceeded to describe the different islands, reviewing in succession the physical features, geological structure, the direction of glaciation, and the various superficial deposits. From an examination of the numerous striated surfaces, as well as from the distribution of boulder-clay and the dispersal of stones in that deposit, they inferred that during the period of extreme cold Shetland must have been glaciated by the Scandinavian Mer de Glace, crossing the islands from the North Sea towards the Atlantic. The authors described the order of succession in the Old Red Sandstone formation in Shetland, and referred to the discovery of an abundant series of plant-remains in rocks which have hitherto been regarded as forming part of the series of ancient crystalline rocks. The plant-remains are identical with those found in the Old Red Sandstone rocks in Caithness, Orkney, and Shetland, from which it was inferred that the quartzites and shales in which the fossils are imbedded must be classed with this formation. The authors also described the great series of contemporaneous and intrusive igneous rocks of Old Red Sandstone age, adducing evidence in proof of the great denudation which has taken place in the members of this formation in Shetland.—On the southerly extension of the Hesse boulder-clay in Lincolnshire, by A. J. Jukes-Browne, B.A., F.G.S.

MANCHESTER

Literary and Philosophical Society, January 8.—Charles Bailey, F.L.S., in the chair.—Mr. Thomas Rogers read a paper on, and exhibited many specimens of, ballast plants collected at Cardiff in September, 1878.

February 25.—E. W. Binney, F.R.S., in the chair.—On the mean temperatures of the winters of the last twenty-nine years, by the Rev. Thomas Mackereth, F.R.A.S., &c.

March 4.—J. P. Joule, F.R.S., president, in the chair.—On a modification of Bunsen's calorimeter, by Prof. Balfour Stewart, LL.D., F.R.S.—The poisonous qualities of the yew, by William E. A. Axon, M.R.S.L., F.S.S.

March 18.—J. P. Joule, F.R.S., president, in the chair.—On siliceous fossilisation, part 2, by J. B. Hannay, F.R.S.E., F.C.S., Assistant Lecturer on Chemistry in the Owens College.

EDINBURGH

Royal Society, March 17.—Prof. Kelland, president, in the chair.—Sir William Thomson communicated a paper on vortex motion, gravitational oscillations in rotating water. This paper contained an investigation of oscillations under the influence of gravity, of a mass of rotating liquid; former communications having been chiefly directed to the discovery of the vortex theory of atoms. In Laplace's great work on the theory of the gravitational oscillations of a mass of water spread over an approximately spherical body, he takes account of the fact that the earth is rotating and of the effects produced thereby on the motions of the ocean, and how these motions are affected by the great continents. Sir William Thomson finds that vortex motion due to the rotation of the earth affects the tides very considerably, even in such comparatively small areas as those of the English Channel and the North Sea. He shows that in a limited basin without an aperture, covering from, say, one to ten degrees of latitude, any tidal phenomenon which there may be, due to the gravitation attraction of the moon, is greatly affected by the rotation of the earth, if the greatest period of free oscillation of liquid in the basin is comparable with the period of rotation of the earth. It is to this fact that the peculiar phenomenon of the tides in the English Channel is due. The peculiarity is this, that for instance when it is high water at Dover, there is low water at the other end of the channel, and simultaneously a nodal line at St. Alban's Head, *i.e.*, no rise or fall there; moreover, there are currents across this nodal line towards the end of the channel at which the tide is rising, *i.e.*, water is flowing east across this line when tide is rising at Dover, and west when it is rising at the other extremity. This phenomenon holds true only for ten or twenty miles on the English side of the Channel. On the French side there is nothing of this kind but a gradual transition of the time of high tide along the coast. On the English coast, within a comparatively short distance, not more

than thirty miles, on either side of the nodal line referred to, there will be high tide on the east simultaneously with low tide on the west. He explains this by showing that in a canal of uniform breadth and depth, along which a wave is travelling, the effect of the rotation of the earth is to make the wave cling to the right hand side in whichever direction the wave is travelling. This manifests itself by the crest of the wave not being of equal amplitude all across the canal, but falling off from the right side down to nothing on the other side if the breadth of the canal is great enough. Where y is the distance of a point from the right bank and x the distance along the bank, the expression for the height of the crest is $e^{-my} \sin(px - qt)$. In a canal which has non-parallel sides, *i.e.*, in which the sides converge, the effect is more marked. This is true of the English Channel or of any other where the time of an oscillation running across from one side to the other and back, is comparable with the period of rotation of the earth. He has worked out the problem in the case of the canal mentioned above, and also for forced and free oscillations in a circular basin.—The next paper was one by Dr. Joseph Coats, Dr. Wm. Ramsay, and Prof. McKendrick, on the action of anæsthetics on the blood pressure. The question they originally wished to solve was whether, in cases where the use of chloroform destroyed life, the result is due to its effect on the respiration or to the action on the heart. They found that at first sight it affected the respiration, but by keeping up artificial respiration they found that it also had an action upon the heart. They experimented both on rabbits and on dogs with the following results:—Chloroform and ethylene chloride reduce the blood pressure, while ether has no appreciable effect. Chloroform reduces the blood pressure much more and much more rapidly than ethylene. It has also an apparently capricious effect on the heart's action, the blood pressure being reduced to nothing and pulsation being very rapid. Sometimes the heart's action was affected as much as a minute or more after the chloroform had ceased to be administered and after the blood pressure had recovered nearly its normal state. The effect of ethylene was to reduce gradually the blood pressure. Chloroform causes death in dogs primarily by paralyzing either the heart's action or the respiration according to the individual's peculiarities. The respiration generally stops before the heart's action ceases. They found that artificial respiration was very effective in restoring animals in danger of dying from the effects of chloroform. Ethylene never produces absolute cessation either of the heart's action or of respiration. The results obtained confirm and amplify those of the Committee of the Royal Medical Chirurgical Society of 1864.—Prof. McKendrick showed some experiments by Mr. Aitken on the physiological action of rotating disks on the retina.—Mr. Thomas Muir gave some general theorems on determinants, *viz.*, an expression for the product of a determinant by one of its minors; a theorem for the reduction of the order of a determinant, another for the multiplication of a determinant by an expression of a number of terms equal to the order of the determinant. He laid on the table a note on alterants.

PARIS

Academy of Sciences, April 7.—M. Daubrée in the chair.—The following papers were read:—On the iodides of stannopropyls, by M. Cahours.—On complementary pirouettes, by M. Chevreul. A disk having one half painted with colour *a*, and the other half white, and being rotated not more than 160 times a minute, nor less than 60, the complementary *c* of *a* appears on the white half.—Consequences of experiments made to imitate terrestrial fractures, with regard to various characters of exterior forms of the ground, by M. Daubrée. He points out several examples of the influence of diaclasses and paraclasses in determining the form of land, their directive influence on erosion, &c.—M. de Lesseps presented a *brochure* of the International African Association, containing a recent lecture by him, and a catalogue of African products at the recent exhibition.—The following elections were made:—M. Alphonse Milne Edwards, member in anatomy and zoology, in place of the late M. Gervais; M. Abich, Correspondent in Mineralogy, in place of M. Damour, elected Free Academician; Mr. Lawes, correspondent in rural economy, in place of the late Marquis de Vibraye.—Analysis of the physiological action of sulphates of magnesia and soda, by M. Moreau. This describes an experiment wherein, some time after ingestion of magnesian sulphate into the intestine, he introduced yellow cyanide of potassium as a test of absorption. The urine afterwards showed no trace of cyanide. The sulphate causes afflux of liquid in the intestinal cavity; so that this occurred in

the present case without manifest absorption.—On the summation of a particular species of series, by M. André.—On displacements produced in the interior of an elastic ground by normal pressure exercised at a point of its surface, by M. Boussinesq.—Heat-centre produced by molecular shocks, by Mr. Crookes.—Reply to M. Flammarion's note on the declination of the magnetic needle, by M. Marié-Davy. The reason of the alleged different action of the needle at Paris he finds in the dissimilarity of the methods employed in calculation of the averages grouped in M. Flammarion's tables.—On the gravivolumeter, by M. Houzeau. In this instrument liquid is forced up out of a vessel into a siphon by blowing through a caoutchouc tube, which is then closed with a spring pincer; on pressing the latter, air enters, and the liquid comes from the siphon drop by drop, with great regularity; the numeration of the drops gives precisely the weight of the liquid.—On determination of the presence of fire-damp in the atmosphere of mines, by MM. Mallard and Le Chatelier. They use a lit jet of hydrogen, which gives a larger and more distinct blue aureola than the flame of a common safety-lamp in presence of fire-damp, and reveals the presence of even 0.25 per cent. of the latter gas. The flame, within a cylinder of copper, is viewed through a lens closing a lateral orifice.—On some conditions of alcoholic fermentation, by M. Richet. Oxygen renders more rapid lactic fermentation of milk. Boiling, by coagulating an albuminoid matter originally soluble, diminishes by one-half the activity of the fermentation. Digestive juices which give soluble albumen and peptones increase the rapidity of lactic fermentation.—On the amylose and amyloid granules of the egg, by M. Dastre. He opposes M. Daréste's affirmation of the presence of amyloid bodies in eggs, maintaining that they are certainly not starch, and have not even the appearance of it.—Determination of sugar in the blood, by M. d'Arsonval. He defends a method of the late Claude Bernard's against recent objections by M. Cazeneuve.—On the method used by Claude Bernard for determination of reducing sugars in the blood, by M. Picard. If there are some animal substances which have the same action on cupric liquors as glucosic solutions, there are a very large number which have rotatory power.—On the distribution of phosphates in the different elements of the blood, by M. Jolly. Alkaline phosphates predominate in the aqueous part of the blood. All the elements contain a variable quantity of phosphate of iron, but it is chiefly accumulated in the corpuscles.—On the formation of a peculiar amyloid matter in the asci of some Pyrenomycetes, by M. Crie. What distinguishes this essentially is (1) its formation in profound darkness by a protoplasm without chlorophyll, and (2) its insolubility in the cellular liquids. This amyloid matter, the physiological rôle of which is not yet known, M. Crie calls amylo-mucine.—On ancient glaciers in the Maritime Alps, by M. Desor.

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